ENDAT-D2550 USERS MANUAL

UNICORN COMPUTER CORP.

ENDAT-D2550

User's Manual

For ENDAT-D2550 PCB ver. A2 or later

Feb.06.2014

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Installation Notice

The manufacturer recommends using a grounded plug to ensure proper motherboard operation. Care should be used in proper conjunction with a grounded power receptacle to avoid possible electrical shock. All integrated circuits on this motherboard are sensitive to static electricity. To avoid damaging components from electrostatic discharge, please do not remove the board from the anti-static packing before discharging any static electricity to your body, by wearing a wrist-grounding strap. The manufacturer is not responsible for any damage to the motherboard due to improper operation.

Specification:

Model	ENDAT-D2550
System Chipset	Intel® NM10
CPU Supporting	Intel Cedar View N2800 (Dual Core, 1.86GHz, 6.5Watt) Intel Cedar View D2550(Dual Core, 1.86GHz, 10 Watt)
Memory	1 x 204-Pin DDR3 SODIMM sockets support DDR3-800/1066 up to 4 GB
Ethernet	2 x Realtek Gb LAN support by RTL8111E
VGA	Intel graphic GMA3600 , Maximum resolution up to 1920 x 1200
LVDS interface	Support 18/24 LVDS with backlight control by standard (maximum resolution 1440x900)
Dual view	CRT + LVDS
Serial/Print	6 ports RS-232 with power selector (+12V / Ring-in / +5V)
RS 422 / 485	by COM2
SATA	2 x SATA2 connectors with AHCI support
USB	USB 2.0 x 8 (4 external + 4 internal/1 Share Mini PCI-E Slot)
Expansion	1 x PICMG 1.0 compliant PCI slot support up to 2 PCI expansions 1 x Mini-PCIe x1 Socket, 1 x SIM card socket (optional)
Watch Dog Timer	On-chip supports 1 to 255 seconds / minutes
AUDIO	On-board supports HD Audio with 1.2W amplifier
Back Panel I/O	1 x PS2 Keyboard & Mouse connector
	3 x D-sub Connector for COM 1,2,3
	1 x VGA
	2 x RJ-45 Connector
	4 x USB(2.0) Connector
	1 x SPK-out
I/O Onboard	1 x PS2 Keyboard & Mouse with 2.54mm Pin Header
	2 x LPT with 2.0mm Box Header
	COM4~COM6 with 2.54 mm Box Header
	4 x USB with 2.54mm Pin Header
	Speaker out, Line-in, CD-in, MIC-in, SPDIF Pin Header
	16-bits digital I/O for CMOS/TTL level (8 bit input / 8 bit output) with 2.0mm Pin Header
	1 x SPDIF + 1 x SM BUS with 2.54mm Pin Header
	SIM Card Socket (optional)
Power Supply	ATX
Form Factor	MINI-ITX (170mm x 170mm)

ENDAT-D2550 USERS MANUAL

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Chapter 1. Introduction

In order to cope with the challenges of the system performance issues and demand of much more visually embedded system in diverse application, ENDAT-D2550 system board provides the ultimate solution with Intel® Cedar View N2800 / D2550 Processors. This package offers a high performance Intel® CPU with optimal power efficiency on the embedded market.

ENDAT-D2550 supports single channel DDR3 800/1066 MHz memory. The maximal capacity is up to 4GB.

ENDAT-D2550 integrated Mobile Intel® Graphics GMA3600 which supports Microsoft DirectX 10 and MPEG-2 decoder for higher visual application.

ENDAT-D2550 supports various kinds of display include VGA, DVI and LVDS; Dual display is also feasible.

ENDAT-D2550 provides one PCI slot and one Mini-PCIe slot to support one standard PCI and Mini-PCIe interface.

The ideal solutions of ENDAT-D2550

- POS system
- KIOSK
- Vehicle system
- Interactive system
- Industrial controller
- Gaming system
- Medical system
- Embedded system equipment

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1-1. Features

Basic Feature:

- Intel® Cedar View N2800 / D2550.
- Single channel DDR3 SO-DIMM socket supports 800/1066 MHz up to 4 GB.
- Dual PCI Express interface Gigabit Ethernet chip on-board.
- Intel® Graphics GMA3600.
- PCI + Mini-PCIe slot support.
- USB 2.0 x 8 (4 external + 4 internal/1 Share Mini PCI-E Slot, USB port7 share Mini PCI-E slot).
- Built-in HD Audio with 1.2W amplifier.
- Four fully functional serial ports.
- ATX Power input.

Software Support

- Drivers for major embedded operating systems: Linux, Windows7.

Ordering information:

Standard edition:

ENDAT-D2550-N : Cedar View N2800
ENDAT-D2550-D : Cedar View D2550

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1-2. Unpacking

The motherboard comes securely packaged in a sturdy cardboard shipping carton. In addition to the User's Manual, the motherboard package includes the following items:

- ENDAT-D2550 System Board
- One SATA HDD Cable
- Serial (2.54mm) port and Parallel port (2.0mm) Cable.
- LCD cable and DVI Cable(Optional)
- CD with Driver utilities for on-board chipsets, VGA and LAN adapter

If any of these items is missing or damage, please contact the dealer whom you purchase the motherboard from. Save the shipping material and carton in the event that you want to ship or store the board in the future.

Note: Leave the motherboard in its original package until you are ready to install it!

1-3. Electrostatic Discharge Precautions

Make sure you properly ground yourself before handling the motherboard, or other system components. Electrostatic discharge can easily damage the components. Note: You must take special precaution when handling the motherboard in dry or air-conditioned environments.

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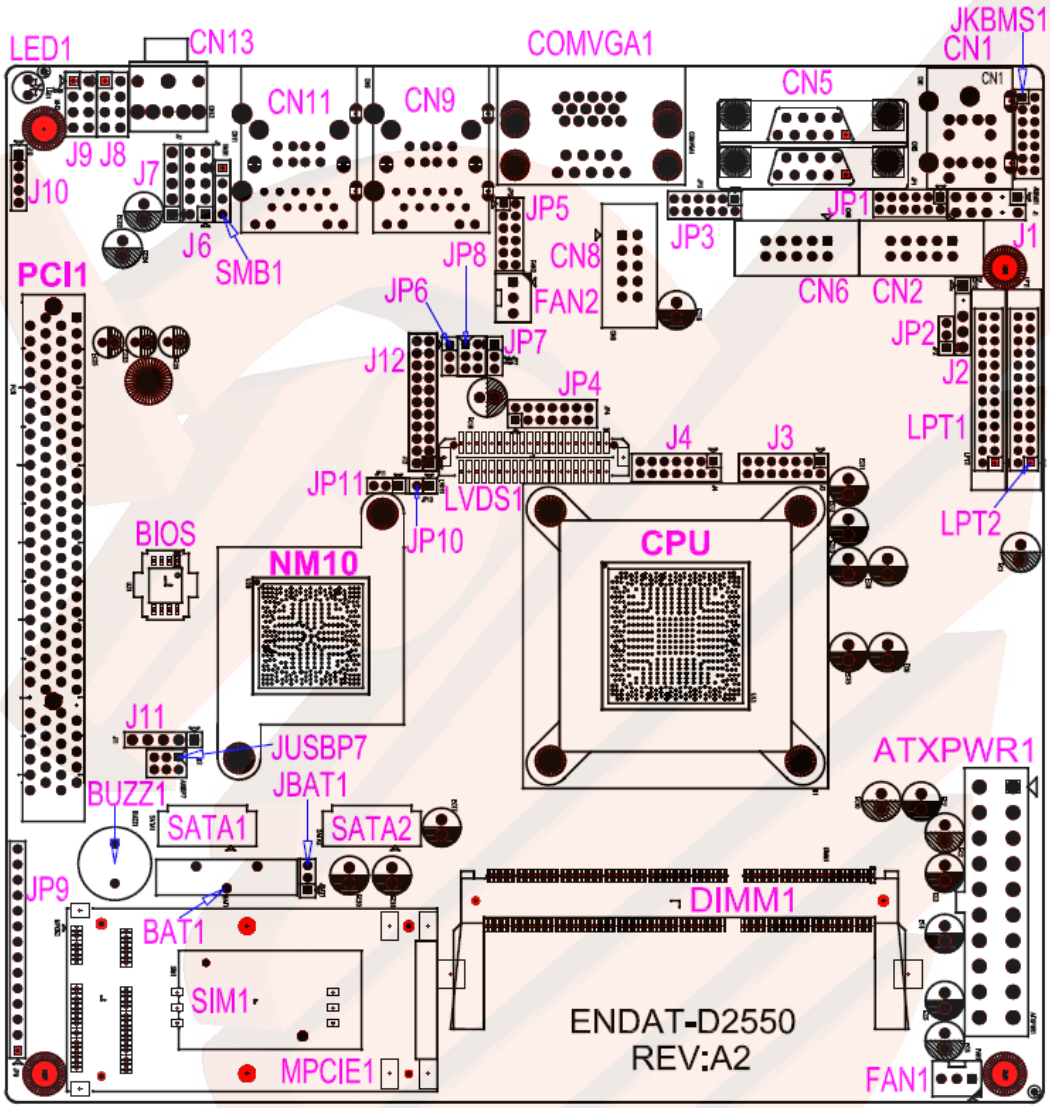
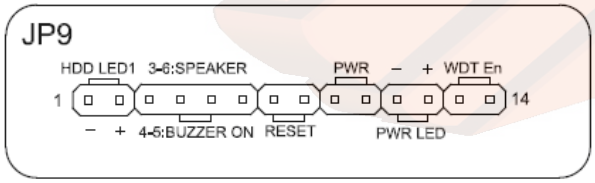
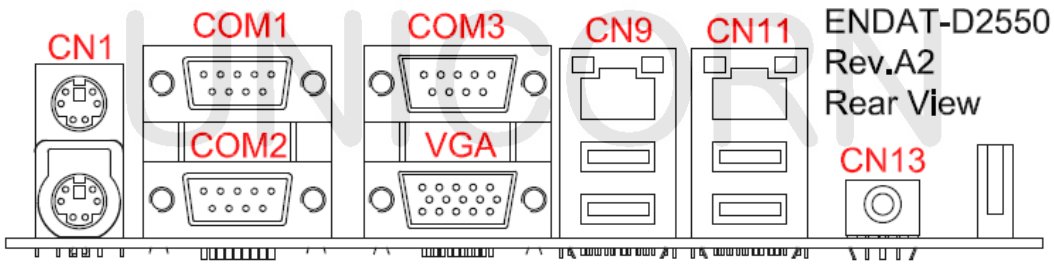
1-4. MOTHERBOARD LAYOUT.







Chapter 2. Setting up the Motherboard

2-1. Connectors / Headers and Jumpers

Connectors Overview:

Function	Connectors
PS/2 MS/KB Connectors	CN1
Cooling Fan Connector	FAN1, FAN2
ATX Power Supply Connector	ATX1
USB 0/1, 2/3 Port	CN9, CN11
LAN Port	CN9, CN11
SATA Connector	SATA1, SATA2
DDR3 RAM Socket	DIMM1
CRT Output Connector	COMVGA1
COM1,2 Connector	CN5
COM3 Connector	COMVGA1
HD Audio Speaker Output	CN13
18/24 bit LCD Panel Connector	LVDS1
PCI Slot	PCI1
Mini PCI-E Socket	MPCIE1
SIM Card Socket	SIM1
Battery Socket	BAT1

Box Headers, Pin Headers Overview:

Function	Connectors
eDP Port Header	J12
EDID Panel	JP4
Printer Port Box Header	LPT1, LPT2
COM 4, 5 ,6 Port Box Header	CN8, CN2, CN6
USB 4, 5, 6, 7 Port Header	J6, J7, J11
PS/2 Mouse/KB Pin Header	J1
External PS/2 Device Header	JKBMS1
SM BUS Pin Header	SMB1

Function	Connectors
Line-Out, CD-In Pin Header	J8
Line-In、MIC-In Pin Header	J9
SPDIF Pin Header	J10
DIGITAL I/O Pin Header	J4, J3

Jumpers Overview:

Function		Connectors
LVDS1	**LCD Voltage Select**	JP8
	LCD Backlight Voltage Select	JP6
	LCD Backlight Control Voltage Select	JP7
	LCD Backlight Voltage (for +5V)	JP10
Clear CMOS		JBAT1
PS2 Power Selector		JP2,
COM1/2/3/4/5/6 Voltage Selector		JP3, JP5, JP1
USB Port7 share to Mini PCIe slot		JUSBP7
Header for Case Panel		JP9
HDD LED		JP9: Pin 1(-), Pin 2(+)
External Speaker		JP9: Pin 3(-), Pin 6(+)
Buzzer On/Off		JP9: Pin 4, Pin 5
Hardware Reset Switch		JP9: Pin 7, Pin 8
ATX Power Supply On/Off Switch		JP9: Pin 9, Pin 10
Power LED		JP9: Pin 11(-), Pin 12(+)
WDT Function Enable/Disable		JP9: Pin 13, Pin 14

Part 1: Onboard Jumpers

JBAT1: CMOS Data Clear (1x3 with 2.0mm)

Pin 1 *	Normal
Pin 1-2	Close for clear CMOS

JP2: PS2 Standby Power Selector (1x3 with 2.0mm)

Pin 1-2 *	+5Vsb
Pin 2-3	+5V

J1: PS/2 Keyboard / Mouse Header (2x5 with 2.54mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	KB Data	**2**	MS Data
3	KEY	**4**	KEY
5	GND	**6**	GND
7	+5V(DC)	**8**	+5V(DC)
9	KB_CLK	**10**	MS_CLK

JKBMS1: External PS/2 Device Header (2x7 with 2.0mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	MS Data Out	**2**	KB Data Out
3	MS Data In	**4**	KB Data In
5	MS CLK Out	**6**	KB CLK Out
7	MS CLK In	**8**	KB CLK In
9	KEY	**10**	KEY
11	+5V(DC)	**12**	+5V(DC)
13	GND	**14**	GND

JP3, JP5, JP1: COM Port Voltage Selector (2x6 with 2.0mm)

Voltage	+12V(DC)	R.I. *	+5V(DC)
JP3 (COM1)	1-2	3-4	5-6
JP3 (COM2)	7-8	9-10	11-12
JP5 (COM3)	1-2	3-4	5-6
JP5 (COM4)	7-8	9-10	11-12
JP1 (COM5)	1-2	3-4	5-6
JP1 (COM6)	7-8	9-10	11-12

JP6: LCD Backlight Voltage Select (1x3 with 2.0mm)

Voltage	+5V *	+12V
JP6 (LVDS1)	1-2	2-3

JP7: LCD Backlight Control Voltage Select (1x3 with 2.0mm)

Voltage	+3.3V *	+5V
JP7 (LVDS1)	1-2	2-3

JP8: LCD Voltage Select (2x3 with 2.0mm)

Voltage	+3.3V *	+5V	+12V
JP8 (LVDS1)	1-2	3-4	5-6

JP10: LCD Backlight Voltage (for +5V) (1x2 with 2.0mm)

	Voltage
JP10 (LVDS1)	+5V

JUSBP7: USB Port Select (2x3 with 2.0mm)

	J11 USB 7 Header	Mini PCIE Slot*
JUSB7	1-3,2-4	3-5,4-6

Notice: JUSBP7 sets USN PORT7 as PCIe slot or USB Header.

Part 2: Onboard Connectors and Headers

D-SUB Type Connector for COM1,2,3 port (RS-232)

Pin No.	Function	Pin No.	Function
1	DCD	**6**	DSR
2	RXD	**7**	RTS
3	TXD	**8**	CTS
4	DTR	**9**	RI
5	GND		

D-SUB Type Connector for COM2 port (RS-485→ 2 Wire)

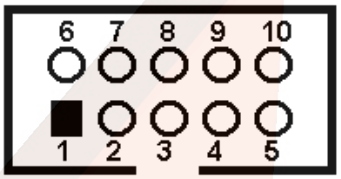
Pin No.	Function	Pin No.	Function
1	Data –	**6**	NA
2	Data +	**7**	NA
3	NA	**8**	NA
4	NA	**9**	NA
5	NA		

D-SUB Type Connector for COM2 port (RS-422→ 4 Wire)

Pin No.	Function	Pin No.	Function
1	–TXD	**6**	NA
2	+RXD	**7**	NA
3	+TXD	**8**	NA
4	–RXD	**9**	NA
5	NA		

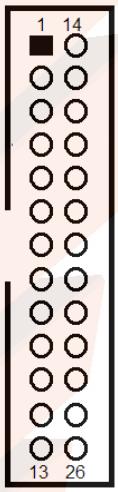
CN8, CN2, CN6: COM4 ~COM6 port Box Headers (2x5 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	DCD	**6**	DSR
2	RXD	**7**	RTS
3	TXD	**8**	CTS
4	DTR	**9**	RI
5	GND	**10**	N.C.



LPT1, LTP2: Printer Port Box Header (2x13 with 2.0mm)

Pin No.	Description	Pin No.	Description
1	STB#	**10**	ACK#
2	PD0	**11**	BUSY
3	PD1	**12**	PE
4	PD2	**13**	SLCT
5	PD3	**14**	AFD#
6	PD4	**15**	ERR#
7	PD5	**16**	INIT#
8	PD6	**17**	SLIN#
9	PD7	**18-25**	GND



J1: PS/2 Keyboard / Mouse Header (2x5 with 2.54mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	KB Data	**2**	MS Data
3	KEY	**4**	KEY
5	GND	**6**	GND
7	+5V(DC)	**8**	+5V(DC)
9	KB_CLK	**10**	MS_CLK

JKBMS1: External PS/2 Device Header (2x7 with 2.0mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	MS Data Out	**2**	KB Data Out
3	MS Data In	**4**	KB Data In
5	MS CLK Out	**6**	KB CLK Out
7	MS CLK In	**8**	KB CLK In
9	KEY	**10**	KEY
11	+5V(DC)	**12**	+5V(DC)
13	GND	**14**	GND

J6, J7, J11: Pin Header for USB 4, 5, 6, 7 ports (2x5 with 2.54mm)

Pin No.	Function	Pin No.	Function
1	USB_VCC	**2**	USB_VCC
3	USBD4-	**4**	USBD5-
5	USBD4+	**6**	USBD5+
7	USB_GND	**8**	USB_GND
9	KEY	**10**	USB_GND

Notice: JUSBP7 sets USN PORT7 as PCIe slot or USB Header.

J4: Digital I/O Header (2x7 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	+5V	**2**	+5V
3	DIO-OUT0	**4**	DIO-IN0
5	DIO-OUT1	**6**	DIO-IN1
7	DIO GND	**8**	DIO GND
9	DIO-OUT2	**10**	DIO-IN2
11	DIO-OUT3	**12**	DIO-IN3
13	+3.3V	**14**	+3.3V

J3: Digital I/O Header (2x7 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	+5V	**2**	+5V
3	DIO-OUT4	**4**	DIO-IN4
5	DIO-OUT5	**6**	DIO-IN5
7	DIO GND	**8**	DIO GND
9	DIO-OUT6	**10**	DIO-IN6
11	DIO-OUT7	**12**	DIO-IN7
13	+3.3V	**14**	+3.3V

J8: LINE-OUT & CD-IN Header (2 x 4 with 2.54mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	LINE_OUT_L	**2**	CD_IN_R
3	JACK_DETECT	**4**	GND_AUD
5	GND_AUD	**6**	GND_AUD
7	LINE_OUT_R	**8**	CD_IN_L

Notice: Please connect the jack detect pin to "GND_AUD" if the actual connector cannot support the jack detect function!

J9: LINE-IN & MIC-IN Header (2 x 4 with 2.54mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	LINE_IN_R	**2**	MIC_ R
3	JACK_DETECT	**4**	JACK_DETECT
5	GND_AUD	**6**	GND_AUD
7	LINE_IN_L	**8**	MIC_ L

Notice: Please connect the jack detect pin to "GND_AUD" if the actual connector cannot support the jack detect function!

J10: SPDIF Header (1 x 5 with 2.54mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	+5V	**4**	GND
2	N.C	**5**	SPDIF-IN
3	SPDIF-OUT		

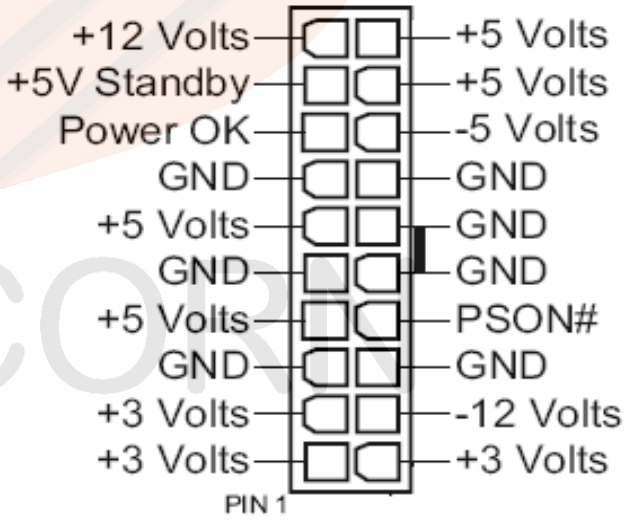
SMB1: SM BUS Header (1 x 5 with 2.54mm)

Pin No.	Signal (KB)	Pin No.	Signal (MS)
1	SMB_CLK	**4**	SMB_DATA
2	+3.3V	**5**	GND
3	IR_RX		

FAN1, FAN2: Cooling Fan Connector

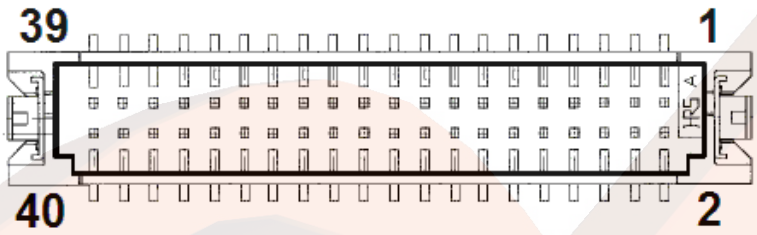
Pin No.	Function
1	GND
2	+12V
3	Sensor Pin

ATXPWR: ATX Power connector



LVDS: Single LVDS (18/24 bit only, 1.25mm)

MB: DF-13A-40DP-1.25V / Map: DF13-40DS-1.25C



Pin No.	Signal	Pin No.	Signal
1	VBL	**2**	VBL
3	GND	**4**	GND
5	DISP.ON/OFF	**6**	GND
7	LCD POWER	**8**	LCD POWER
9	GND	**10**	GND
11	Odd 0+	**12**	Odd 0-
13	Odd 1+	**14**	Odd 1-
15	Odd 2+	**16**	Odd 2-
17	Odd 3+	**18**	Odd 3-
19	Odd CLK+	**20**	Odd CLK -
21	GND	**22**	KEY
23	N.C	**24**	N.C
25	N.C	**26**	N.C
27	N.C	**28**	N.C
29	N.C	**30**	N.C
31	N.C	**32**	N.C
33	LCD POWER	**34**	LCD POWER
35	GND	**36**	GND
37	GND	**38**	GND
39	VBL	**40**	VBL

Please make sure the Pin 1 location before plug-in LCD connector.
Please leave pin 23rd ~ pin 32nd unconnected if the single channel LVDS function is needed.

Please double check "jumper setting & LCD cable's orientation" before power-on, any incorrect installation may caused damaged of the LCD.

2-2. Installing Memory

The DDR3 SO-DIMM sockets of ENDAT-D2550 support up to 4GB memory. The speed of DDR3 memory can be DDR3-800 or DDR3-1066.

2-3. Shared VGA Memory

The ENDAT-D2550 built-in Intel® GMA3600 graphic engine with DVMT 4.0 up system memory. The amount of video memory on motherboard determines the number of colors and the video graphic resolution.

2-4. Watch Dog Timer

Watch dog Timer (WDT) is a special design for system monitoring to secure the system work normally. WDT has an independent clock from the oscillator and could set time and clear/refresh WDT counter function. When time is up, WDT will send hardware RESET signal to reset system.

Timeout Value Range

-1 to 255

-Second or Minute

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Sample code (using TurboC/C++ 3.0):

```
#include <stdio.h>
#include <dos.h>
#include <dir.h>
void show_ver();
void main()
{
        unsigned int tt;
        clrscr();
        show_ver();
        tt=0;
        while((tt==0)||(tt>255))
        {
                printf("\n\nPlease key in how many seconds you want to reset system (1~255):");
                scanf("%d",&tt);
        }
        outportb(0x2e,0x87);       //Unlock register
        outportb(0x2e,0x87);       //Unlock register
        outportb(0x2e,0x07);       //set Logic Device number pointer
        outportb(0x2f,0x08);        //set Logic Device number
        outportb(0x2e,0x30);       //set  WDTO active
        outportb(0x2f,0x01);       //set reg value active (bit0 =1 active,0 inactive )
        outportb(0x2e,0xf5);       //set WDTO Control Mode
        outportb(0x2f,0x04);       //set register value (bit3=1: minute. =0: second)
        outportb(0x2e,0xf6);       //set WDT Counter
        outportb(0x2f,tt);          //set time out value of WDT
}

void show_ver()
{
        unsigned char tmp0;
        printf("Designed by attila of UNICORN computer corp.  \n2012/08/29  release
version:1.0a\n");
        printf("This program is design for test Watch Dog Timer for ENADT-D2550
(W83627UHG).\n");
}
```

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2-5. Digital I/O

J4 Pin define:

J4: Digital I/O Header (2x7 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	+5V	**2**	+5V
3	DIO-OUT0	**4**	DIO-IN0
5	DIO-OUT1	**6**	DIO-IN1
7	DIO GND	**8**	DIO GND
9	DIO-OUT2	**10**	DIO-IN2
11	DIO-OUT3	**12**	DIO-IN3
13	+3.3V	**14**	+3.3V

Digital I/O port address:

This function is support by onboard super I/O chip; it can be control easily by change the register of super I/O chip via I/O port “2Eh” and “2Fh”. Please see the sample code of below for implement. Voltage tolerance: +/- 5% with 0V to +5V.

Sample code for input (using Turbo C/C++ 3.0):

bit No	7	6	5	4	3	2	1	0
Map	DIO-I3	DIO-I2	DIO-I1	DIO-I0	NA	NA	NA	NA

Sample code for input (using Turbo C/C++ 3.0)

```
#define input_port 0x2f // Digital input data port
        Unsigned char read_data;
        outportb(0x2e,0x87);        //Unlock register
        outportb(0x2e,0x87);        //Unlock register
        outportb(0x2e,0x07);        //set Logic Device number pointer
        outportb(0x2f,0x08);        //set Logic Device number
        outportb(0x2e,0x30);        //set Device Active
        outportb(0x2f,0x02);        // set Bit 1 =GPIO5 ; 0=Inactive / 1= Active Default: 03h
        outportb(0x2e,0xE0);        // set GPIO Output / Input Port
        outportb(0x2f,0xF0);        // 0=Output/ 1=Input ; Default: F0h
                                    // Bit 0~3 DIO-O0~ DIO3 / Bit4~7 DIO-I0~DIO-I3.
        outportb(0x2e,0xF1);        //Read DIO-Input  register.
                                    //Bit4~Bit7 = DIO-I0~DIO-I3.(Read Only)

        read_data=inportb(input_port);    // Read digital input data
        printf("DIO-Input=%02X\n",read_data);    //Show digital input data on screen
```

Sample code for output (using Turbo C/C++ 3.0):

bit No	7	6	5	4	3	2	1	0
Map	NA	NA	NA	NA	DIO-O3	DIO-O2	DIO-O1	DIO-O0

Sample code for output (using Turbo C/C++ 3.0)

```
outportb(0x2e,0x87);      //Unlock register
outportb(0x2e,0x87);      //Unlock register
outportb(0x2e,0x07);      //set Logic Device number pointer
outportb(0x2f,0x08);      //set Logic Device number
outportb(0x2e,0x30);      //set Device Active
outportb(0x2f,0x03);      // set Bit 1 =GPIO5 ; 0=Inactive / 1= Active Default: 03h
outportb(0x2e,0xE0);      // set GPIO Output / Input Port
outportb(0x2f,0xF0);      // 0=Output/ 1=Input
                          // Bit 0~3 DIO-O0~ DIO3 / Bit4~7 DIO-I0~DIO-I3.
outportb(0x2e,0xE1);      //Read DIO-Input  register.
outportb(0x2f,0xnm);      // n=DIO-I0~DIO-I3 / m=DIO-O0~DIO-O3.
                          Bit3~Bit4 = DIO-I0~DIO-I3.(Read Only)
```

J3 Pin define:

J3: Digital I/O Header (2x7 with 2.0mm)

Pin No.	Function	Pin No.	Function
1	+5V	2	+5V
3	DIO-OUT4	4	DIO-IN4
5	DIO-OUT5	6	DIO-IN5
7	DIO GND	8	DIO GND
9	DIO-OUT6	10	DIO-IN6
11	DIO-OUT7	12	DIO-IN7
13	+3.3V	14	+3.3V

Digital I/O port address:

This function is support by onboard super I/O chip; it can be control easily by change the register of super I/O chip via I/O port “4Eh” and “4Fh”. Please see the sample code of below for implement. Voltage tolerance: +/- 5% with 0V to +5V.

Sample code for input (using Turbo C/C++ 3.0):

bit No	7	6	5	4	3	2	1	0
Map	DIO-I7	DIO-I6	NA	NA	NA	NA	DIO-I5	DIO-I4

Sample code for input (using Turbo C/C++ 3.0)

```
#define input_port 0x4f // Digital input data port
        Unsigned char read_data;
        outportb(0x4e,0x87);        //Unlock register
        outportb(0x4e,0x87);        //Unlock register
        outportb(0x4e,0x07);        //set Logic Device number pointer
        outportb(0x4f,0x07);        //set Logic Device number
        outportb(0x4e,0x2A);        //set GOIP Function
        outportb(0x4f,0xFC);        //set GP10~GP17
        outportb(0x4e,0x30);        //set Device Active
        outportb(0x4f,0x01);        // set Bit 1 = Active; 0=Disable
        outportb(0x4e,0xF0);        // set GPIO Output / Input Port
        outportb(0x4f,0xC3);                // 0=Output/ 1=Input
                                    //Bit 2~5 DIO-O4~ DIO-O7.
                                    //Bit 0,1,6,7 DIO-I4~DIO-I7.
        outportb(0x4e,0xF1);        //Read DIO-Input  register.
        outportb(0x4f,0xnm);        //Bit 2~5 DIO-O4~ DIO-O7.
                                    //Bit 0,1,6,7 DIO-I4~DIO-I7..(Read Only)

        read_data=inportb(input_port);    // Read digital input data
        printf("DIO-Input=%02X\n",read_data);    //Show digital input data on screen
```

Sample code for input (using Turbo C/C++ 3.0):

bit No	7	6	5	4	3	2	1	0
Map	NA	NA	DIO-O7	DIO-O6	DIO-O5	DIO-O4	NA	NA

Sample code for output (using Turbo C/C++ 3.0)

```
        outportb(0x4e,0x87);        //Unlock register
        outportb(0x4e,0x87);        //Unlock register
        outportb(0x4e,0x07);        //set Logic Device number pointer
        outportb(0x4f,0x07);        //set Logic Device number
        outportb(0x4e,0x2A);        //set GOIP Function
        outportb(0x4f,0xFC);        //set GP10~GP17
        outportb(0x4e,0x30);        //set Device Active
        outportb(0x4f,0x01);        // set Bit 1 = Active; 0=Disable
        outportb(0x4e,0xF0);        // set GPIO Output / Input Port
        outportb(0x4f,0xC3);                // 0=Output/ 1=Input
                                    //Bit 2~5 DIO-O4~ DIO-O7.
                                    //Bit 0,1,6,7 DIO-I4~DIO-I7.
        outportb(0x4e,0xF1);        //Read DIO-Input  register.
        outportb(0x4f,0xnm);        // Bit 2~5 DIO-O4~ DIO-O7.
                                    //Bit 0,1,6,7 DIO-I4~DIO-I7..(Read Only)
```

Chapter 3. AWARD BIOS SETUP

Phoenix – Award BIOS CMOS Setup Utility

> Standard CMOS Features	**> PC Health Status**
> Advanced BIOS Features	**Load Optimized Defaults**
> Advanced Chipset Features	**Set Supervisor Password**
> Integrated Peripherals	**Set Password**
> Power Management Setup	**Save & Exit Setup**
> PnP/PCI Configurations	**Exit Without Saving**

Use the BIOS CMOS setup program to modify the system parameters to reflect the environment installed in your system and to customize the system as desired. Press the <DEL> key to enter into the BIOS CMOS setup program when you turn on the power. Settings can be accessed via arrow keys. Press <Enter> to choose an option to configure the system properly.

In the main menu, press F10 or “SAVE & EXIT SETUP” to save your changes and reboot the system. Choose “EXIT WITHOUT SAVING” to ignore the changes and exit the setup procedure. Pressing <ESC> at anywhere during the setup will return to the main menu.

All of the above CMOS BIOS items require board knowledge on PC/AT system architecture. Incorrect setup could cause system malfunctions.

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Following setting belongs to standard function setting:

Standard CMOS Features

The features setting Data/Time and SATA port 、system memory Information.

˙System Date (mm:dd:yy) .
˙System Time (hh:mm:ss).
˙Halt On (All Error, No Error, All, But Keyboard).
˙System Memory Information
This submenu provides information about the system memory.

Advanced BIOS Features

The features setting system boot-up priority and keyboard operation、BIOS Security.

Hard Disk Boot Priority	Select Hard Disk Device Priority.
USB Boot Priority	Select USB Device Priority.
First Boot Device	Select Boot Device Priority.
Second Boot Device	
Third Boot Device	
Security Option	Select whether the password is required every time the system boots or only when you enter setup.

Advanced Chipset Features

The features setting displays devices、LCD panel Support and LAN Boot.

PCI Express Root Port Func	Boot On LAN1/2 Support.
Select Active LFP	LVDS Panel Support.
Panel Type	Select LCD (Integrated LVDS) resolution. 640x480x18bit, 800x600x18bit, 1024x768x18bit, 1024x768x24bit, 1366x768x18bit, 1366x768x24bit, 800x480x18bit, 1024x600x18bit, 1280x600x18bit,1280x800x18bit 1280x768x18bit, 1440X900X18bit

Integrated Peripherals

The features setting IO (serial and parallel port) resources, SATA type and AUDIO、USB Controller set.

OnChip IDE Device	
>> SATA Mode	SATA Support IDE or AHCI
Onboard Device	
>> Intel HD Audio Controller	HD Audio Controller
SuperIO Device	
>> Onboard Serial Port 1 / 2	Serial Port 1 & 2
COM2 Support Mode	Support RS232 / 485 /422
COM2 Termination	Termination En/Disable
>> Onboard Parallel Port:	Parallel 1
Onboard Serial Port 3 / 4 / 5 / 6	Serial Port 3 & 4 & 5 & 6
Serial Port 3 / 4 / 5 / 6 Use IRQ:	Serial Port 3 & 4 & 5 & 6 IRQ
Watch Dog Timer Select	Enable WDT Function.
PWRON After PWR-Fail:	AC power loss status

Power Management Setup

The features setting System power management mode and Wake UP function.

ACPI Function	
ACPI Suspend Type	Support S1 , S3
USB KB Wake-Up From S3	USB Key board & Mouse Wake-Up.
Resume by Alarm	RTC Wake-Up.

PnP/PCI Configurations

The features setting init display First and System IRQ Resources.

Init Display First	Select First Boot Display for Onboard or PCI Device.
Resources Controlled By	Set System IRQ Resources for Auto or Manual
IRQ Resources	Set System IRQ Resources by Manual.

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PC Health Status

The features Show System temperature、temperature protection 、Fan speed 、voltage.

Shutdown Temperature	When the CPU temperature exceeds the set, the system will automatically shut down.
CPU Warning Temperature	When the CPU temperature exceeds the set, the system will issue a warning sound.

Load Optimized Defaults

The features Load BIOS default setting.

Set Supervisor Password

The features Set BIOS setup administrator password.

Set User Password

The features Set BIOS setup user password.

Save & Exit Setup

The features save BIOS setting and exit BIOS setup

Exit Without Setup

The features not save BIOS setting and exit BIOS setup

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Chapter 4. VGA, LVDS and drivers

4-1. Graphic controller Feature

The ENDAT-D2550 integrated a high performance Intel® GMA3600 GFX engine with Intel® DVMT 4.0 technology. The Intel® GMA3600 offering the 3D enhancements enable greater flexibility and scalability. Improved GFX engine support Microsoft DirectX 10, OpenGL 1.5 on Windows, and OpenGL 2.0 on Linux.

The ENDAT-D2550 integrated graphics device (IGD) delivering cost competitive 3D, 2D and video capabilities. It contains an extensive set of instructions for 3D operations, 2D operations, motion compensation, overlay, and display control. The video engines support video conferencing and other video applications. The Intel® GMA3600 uses a UMA configuration with Intel® DVMT for graphics memory.

The ENDAT-D2550 also has the capability of supporting external graphics accelerators via the PCI slot but cannot work concurrently with the integrated graphics device. High bandwidth access to data is provided through the system memory port.
The build-in Graphics Controller's main features include:

- High Performance 3D and 2D graphics controller
- Support Microsoft DirectX 10
- Hardware frame buffer compression improves UMA (Unified Memory Architecture) memory efficiency
- VGA resolution up to 1920 x 1200
- LVDS (Integrated LVDS) resolution up to 1440x900

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4-2. Driver Utility Installation Guide

1. When finishing the installation of Windows XP (support 2D graphic only), Vista, please install the relative Intel® chipsets, display and AUDIO driver manually for compliance compatibility of hardware environment.

2. Please contact sales department of UNICORN for Embedded OS user driver (Linux, Windows CE and Windows XP embedded). All of embedded OS driver is not be included in any versions of driver CD-ROM from UNICORN.

Please download or check from Intel® web site: www.intel.com for more information or last versions of driver as needs!

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Appendix A: FLASH MEMORY UTILITY

Using this package to update the system BIOS from a disk file to the on board Flash memory. Be aware any improper update of the system BIOS will cause the malfunction of the system.

Method of update BIOS:

1. Please contact one of the Sales Representative on behalf of Unicorn to acquire “BIOS update package”, and process following procedures for the BIOS UPDATE.
2. Prepare a bootable storage that can boot under MS-DOS, (such as HDD, USB sticker…etc)
3. Unzip “BIOS Update package” into the bootable storage.
4. Run the Flash file.

AwardBIOS FLASH Utility V8.102 C>Phoenix Technologies Ltd. All Rights Reserved
Flash Type – File Name to Program: _
Message:

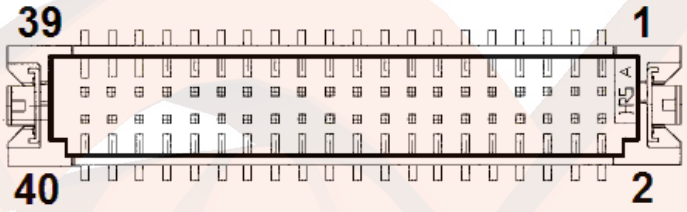
5. Once the BIOS is Flash successfully, Reboot the system.
6. Press <Del> to enter BIOS Setup, save BIOS default and exit <F10>.

**** Please turn off system and clear CMOS data by JBAT1.***
**** Please restart your system and load setup default.***

Appendix B: LVDS PIN ASSIGNMENT

LVDS: Single /Dual Channel LVDS (18/24/36/48 bit only, 1.25mm)

MB: DF-13A-40DP-1.25V / Map: DF13-40DS-1.25C



Pin No.	Signal	Pin No.	Signal
1	VBL	**2**	VBL
3	GND	**4**	GND
5	DISP.ON/OFF	**6**	GND
7	LCD POWER	**8**	LCD POWER
9	GND	**10**	GND
11	Odd 0+	**12**	Odd 0-
13	Odd 1+	**14**	Odd 1-
15	Odd 2+	**16**	Odd 2-
17	Odd 3+	**18**	Odd 3-
19	Odd CLK+	**20**	Odd CLK -
21	GND	**22**	KEY
23	Even 0+	**24**	Even 0-.
25	Even 1+	**26**	Even 1-
27	Even 2+	**28**	Even 2-
29	Even 3+	**30**	Even 3-
31	Even CLK+	**32**	Even CLK-
33	LCD POWER	**34**	LCD POWER
35	GND	**36**	GND
37	GND	**38**	GND
39	VBL	**40**	VBL

Please make sure the Pin 1 location before plug-in LCD connector.
Please leave pin 23rd ~ pin 32nd unconnected if the single channel LVDS function is needed.

Please double check "jumper setting & LCD cable's orientation" before power-on, any incorrect installation may caused damaged of the LCD.

Appendix C: LIMITED WARRANTY

Standard Two years limited warranty on all our ENDAT series all-in-one motherboards and embedded board. Products that become defective during the warranty period shall be repaired, or subject to manufacturer's option, replaced. The limited warranty applies to normal proper usage of the hardware and does not cover products that have been modified or subjected to unusual electrical or physical stress. Unicorn Computer Corp is not liable to repair or replace defective goods caused by improper using or use of unauthorized parts. The following situations will be charged:

1. The products during the warranty but defective caused by improper using or artificial external pressure and result in the components damages. According to the damage situation, the manufacturer has the rights to decide to repair or not. The manufacturer will charge the parts/repair cost and the returning shipping charge.
2. The products out of warranty will charge the parts/repair cost and the returning shipping charge as per the repair status.
3. The manufacturer has the rights to decide to repair or not based on the stock of parts for the products which are phased out of the production.
4. Please e-mail or fax the RMA Service Request Form when have the defective products.

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RMA SERVICE REQUEST FORM

When requesting RMA service, please fill out this “RMA Service Request Form”. This form needs to be shipped with your returns. Service cannot begin until we have this information.

RMA NO.:

Company:	Person to Contact:
Phone No:	Purchase Date :
Fax No. :	Applied Date :
Return Shipping Address:	

Model No.	Serial No.	Problem Description

Please specify the following when returning the RMA boards:
(1) Hardware Configuration (2) OS or Software (3) Testing Program

_____
Authorized Signature